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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/552,383	04/19/2000	Stephen L. Willis	MICRON.092CP1	3147

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EXAMINER

DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

9

DATE MAILED: 03/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/552,383

Applicant(s)

WILLIS, STEPHEN L.

Examiner

José R. Díaz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-37 is/are pending in the application.
- 4a) Of the above claim(s) 38-55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

➤ Claims 38-55 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group(s), there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 8.

Claim Rejections - 35 USC § 103

➤ The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

➤ Claims 30-32, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Han (US Pat. No. 6,107,191) in view of Sandhu et al. (US Patent No. 5,069,002).

Regarding claims 30-32, Han teaches a method of forming a semiconductor device (see cols. 1-8) comprising the steps of: forming a dielectric (230, 240) (see Fig. 2A); forming a shield layer (235) (see Fig. 2A); forming a sacrificial layer (245) (see Fig. 2A); depositing a conductive material (270) (see Fig. 2G); removing the conductive material (270) and the sacrificial layer (245) by using CMP process (see Fig. 2H). However, Han fails to teach the step of detecting when the CMP process has removed the sacrificial layer. Sandhu et al. teach that is well known in the art to perform a sensing step during the CMP process, in which the change in friction is detected by

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rotating the wafer and polishing surface with electric motors and measuring current changes on one or both of the motors (see Abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the same time the invention was made to modify Han to include a sensing step during the CMP process, in which the change in friction is detected by rotating the wafer and polishing surface with electric motors and measuring current changes on one or both of the motors. The ordinary artisan would have been motivated to modify Han in the manner described above for at least the purpose of producing a signal to operate control means for adjusting or stopping the process.

Regarding claim 34, Han teaches that the CMP process comprises an etchant selected to remove the sacrificial layer and wherein the shield layer is selected to be resistant to the selected etchant (see col. 5, lines 5-36 and col. 6, lines 14-16).

Regarding claim 37, Han teaches the further step of forming a cavity (250, 255) in the dielectric layer (see Fig. 2F) and wherein depositing the conductive material (270) on the sacrificial layer (245) results in the cavity being filled with the conductive material (see Figs. 2G-2H).

➤ Claims 33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Han (US Pat. No. 6,107,191) in view of Sandhu et al. (US Patent No. 5,069,002), and further in view of Többen et al. (US Patent No. 6,103,456).

Regarding claims 33 and 35-36, a further different between the claimed invention and the reference is the composition of each layer in the device. Han provides a general teaching of using any dielectric materials for the dielectric layer, the shield layer and the

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sacrificial layer (see col. 5, lines 25-37). Többen et al. teach that is well known in the art to use a DARC or nitride material as the shield layer (41) (see col. 11, lines 17-20), and an oxide layer as the sacrificial layer (42) (see col. 13, lines 4-8) and/or as a layer (23) under the shield layer (see col. 1, lines 20-31, and col. 8, lines 24-26). Therefore, it would have been obvious to one having ordinary skill in the art at the same time the invention was made to further modify Han to include the use of DARC, nitride, and/or BPSG as the dielectric materials. The ordinary artisan would have been motivated to further modify Han in the manner described above for at least the purpose of providing protective layers with different etch rates.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R. Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00 - 5:00 Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-3891 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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JRD
March 10, 2002



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